General FAQs

Q What is Waste-to-Energy (or the incineration of municipal solid waste)?

A: The Department for Environment, Food and Rural Affairs (Defra) report, "Incineration of Municipal Solid Waste", which is the government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom, provides a concise holistic explanation of WTE.

Site-Related FAQs

Q Why is only one Waste-to-Energy (WTE) site being considered?

A: In page 6 of the January 27, 2009 DUSWM/NEA memorandum, nine (9) sites were considered and five (5) were eliminated for one or more of the following reasons: 1. Lack of (or a long distance to) a suitable and reliable non-potable water source; 2. Inadequate land area for facility and/or buffers, or, 3. Distance to electrical interconnection (sub-station). Although four acceptable sites were considered, the BOCC decided to consider the McKinney Industrial and Potomac Edison (MD 28) sites. Subsequently, on February 12, 2009 in a Press Release, the BOCC removed the Potomac Edison site from further consideration due to its rural/agricultural designation.

Q: Why is the WTE facility being considered in Frederick County and not Carroll County?

A: Frederick County has the responsibility to manage its own trash. The County's analysis to date indicates that the lowest cost, most environmentally sound approach is a regional WTE facility. The BOCC conducted a Public Hearing on December 11th and 12th, 2007 regarding the possible construction of regional project, which would be located in the vicinity of the McKinney Industrial Center. At the conclusion of the Public Hearing, the Frederick County Commissioners decided to meet with the Carroll County Commissioners to discuss the regional concept. On February 26, 2008, a joint meeting of the Frederick and Carroll County Commissioners occurred, at which time the Frederick County Commissioners invited Carroll County to participate in a possible regional project that would be located in Frederick County. On March 28, 2008 the Carroll County Commissioners responded affirmatively to this invitation.

Q: Is it true that the WTE's emission stack could be between 250 feet and 375 feet in height?

A: Yes. However, the 350 to375 foot height ranges that have been presented are a "worse-case" so as to be able to answer questions preliminarily, and are based on other similar facilities. The final stack height will not be known until air modeling is completed as part of the permitting process. As a matter of information, all of the air emission control takes place in equipment on the ground and the purpose of the stack is to disperse waste heat as well as water vapor, carbon dioxide and trace emissions. An appropriate stack height ensures adequate mixing of flue gases with the surrounding air.

Q: How would the stack appear as viewed from the Monocacy Battlefield?

A: See the photos of the existing ESSROC stack, which is approximately 300 feet tall, illustrate what is currently viewed today from the Worthington House along with a rendering of how the WTE would appear.

Q: What road improvements are necessary for the McKinney Site, particularly since many developments have contributed significant monies to address inadequacies of the roads, namely Buckeystown Pike (MD 85)?

A: Although any WTE site is exempt from APFO pursuant to §2-13-3(d)(5)(III) of the Frederick County Code of Public Local Laws, a preliminary traffic study shows that MD Route 85 has adequate capacity to accommodate the expected WTE generated traffic. If the preliminary study's findings change and certain improvements are required, the project has $15 million in contingencies for this very purpose.

Q: Why not choose a location in a less-populated area?

A: WTE facilities around the world have purposely been located in densely populated areas to take advantage of district heating and cooling systems using WTE facility's steam and to allow the reuse of treated wastewater (effluent) from nearby wastewater treatment plants (See the answer to the FAQ, "Why is only one Waste-to-Energy (WTE) site being considered?"). The press release stated: "*Upon reflection and careful consideration of the factors surrounding the Potomac Edison site, the board agrees that this location is in conflict with our support for Frederick County agricultural preservation programs and our position on the location of power plants in rural areas. The board also feels that a potential site for a waste to energy facility should be in an industrial area.*"

Q: Isn't there a significant amount of floodplain through the McKinney site that would be disturbed by a WTE?

A: No. The McKinney site is adjacent to the floodplain and was a known site constraint. Although not expected, if any minor modifications were necessary to the floodplain, the preferred vendor (Wheelabrator Technologies, Inc.) is responsible for the environmental permits associated with same.

Q: Is the McKinney Site within the 500 ft setback zone created by Monocacy Scenic River Advisory Board?

A: The McKinney Industrial Park subdivision, where the WTE facility is being considered, was subdivided in December 1987 and preceded 1990 Monocacy River Management Plan. The 500-foot setback zone is a River Corridor Overlay Boundary and is a recommended land use planning tool. The riparian buffer within the floodplain that already exists will be preserved, with the exception of trees where existing water and sewer infrastructure is located. After evaluating the 100-year floodplain elevation, with respect to the centerline of the Monocacy River, the average distance is approximately 440 feet, which exceeds that of other properties in the immediate vicinity that were developed after 1990, e.g., Toys "R" Us Distribution Center (See the aerial orthophoto of the area).

Q: What is impact to adjacent property values if a WTE is constructed?

A: There is no evidence in the U.S. that WTE facilities have de-valued adjacent property. The McKinney Industrial Park is the location of several existing large industrial/commercial buildings and the County's largest sewage treatment plant. The proposed WTE facility would be smaller than several of the existing buildings and will generate less vehicle traffic than other industrial/commercial properties located in the Park (See the aerial orthophoto of the area).

Climate Change Related FAQs

Q: It is inconsistent to talk about climate change when burning trash—so how can a WTE reduce greenhouse gases (GHG)?

A: According to the EPA management of municipal solid waste presents many opportunities for GHG emission reductions. Source reduction and recycling can reduce GHG emissions at the manufacturing stage, increase forest carbon sequestration, and avoid landfill CH_4 emissions. When waste is combusted, energy recovery displaces electricity generated by utilities by burning fossil fuels (thus reducing GHG emissions from the utility sector), and landfill CH_4 emissions are avoided. The EPA considers WTE facilities as net reducers of greenhouse gases. (See the FAQ pertaining to the RTI International study.)

Renewable Energy Related FAQs

Q: How can a WTE be promoted as an electric generator when compared to other power plants?

A: Renewable energy projects, i.e., wind, solar, biomass and WTE, are often smaller than large fossil fuel fired power plants and are not truly comparable. For example, a 55 Megawatt (MW) electric generating capacity WTE facility is a large facility when compared to other types of renewable energy projects. For example, it takes about seven (7) acres of solar cells to generate 1 MW of electricity, and solar energy is only generated on sunny days—not at night. In some cases a WTE plant electrical production is comparable to some conventional power plants such the 110 MW R.P. Smith coal-fired plant located in Washington County and adjacent to the C&O Canal or the 65 MW coal-fired plant at Luke Mill, or the 65 MW oil-fired plant in Easton, Maryland. They can also be larger than some fossil fuel power plants such as Berlin, Maryland's 9 MW oil-fired power plant.

In addition, Maryland Executive Order 01.01.2001.02 states:

A. Clean Energy Procurement Goal.

(1) For purposes of this Executive Order, "Green Energy" is defined as energy generated from the wind, solar photovoltaic, solar thermal, biomass, landfill gas and the combustion of municipal solid waste. (Emphasis added)

(2) For the procurement of electricity for use within State owned facilities, the State of Maryland has a goal of 6% to be generated from Green Energy. No more than 50% of the total Green Energy procurement shall be derived from the combustion of municipal solid waste. (Emphasis added)

The position statement of the Solid Waste Processing Division and Energy Committee of ASME's Technical Communities of Knowledge and Community recommended to Congress and the Administration:

- Include WTE in the federal Renewable Portfolio Standard.
- Consider the reduction in greenhouse gases benefits of WTE in climate change policy.
- Direct the EPA to consider "life cycle analysis" of waste disposal options and also to consider Maximum Achievable Control Technology (MACT) type regulations on all emission sources, as have been applied to WTE facilities.

Water Quality/River Related FAQs

Q: If the ash coming from a WTE is buried in a landfill, are there concerns about the contamination of the groundwater since no landfill is safe?

A: All landfills are constructed in accordance with State and Federal standards and have liners. Ash from a WTE is safe. Ash residue from waste-to-energy facilities is tested in accordance with strict state and federal leaching tests and is consistently shown to be safe for land disposal and reuse. Waste-to-energy reduces the volume of trash by about 90%, resulting in a 90% decrease in the amount of land required for garbage (MSW) disposal. Ash also exhibits concrete-like properties causing it to harden once it is placed and compacted in a landfill, reducing the potential for rainwater to leach contaminants from ash landfills into the ground. There are no known instances of groundwater contamination from WTE ash that has been placed in a modern lined landfill such as we have in Frederick County. (See an answer to a related FAQ.)

Q: What is the amount of water used at a WTE?

A: The facility will use about 500,000 gallons per day of treated wastewater from the Ballenger Creek Wastewater Treatment Plant for cooling purposes. This water will be evaporated. A small amount of water will also be used for boiler water make-up. No water from the Monocacy River will be used.

Cost Related FAQs

Q: What is the anticipated cost of the WTE facility?

A: See Page 19 (of 28) of the January 27, 2009 memorandum. The Guaranteed Fixed Construction Price is for the 1,500 TPD regional WTE plant is $332,000,000 as of the best-and-final-offer (BAFO) date (November 2009) and is adjusted according to a power plant construction index and since March 2009 it has decreased by $9,666,180. This GFCP price is adjusted only for the following: Change Orders requested by NEA (directed by the Counties), Uncontrollable Circumstances, Frederick County Building Permit Fees, Interconnection Agreement Fees and Work (no Company

mark-up), Design and Construction of the Effluent Pipeline, Addition of a Truck Tipper System (if elected by Carroll County), Adjustment (up or down) due to variation for landscaping, exterior lighting and architectural treatment from the allowance in the Company's design. No adjustments are required, but are optional. Frederick County's share of the regional project cost is 60%.

Q: Will the costs of the WTE rise through vendor change orders?

A: No. The cost is fixed and guaranteed by the vendor. Any cost overruns will be borne by the vendor as identified in Article IX of the Final Draft Service Agreement (page 229 of 526) in the staff report.

Q: Will the WTE facility cost exceed that of long-hauling to an out-of-state landfill?

A: The WTE cost is less than out-of-state hauling over the 30-year study period. In the July 28, 2008 RTI International study, the primary goal of the study was to identify and quantify the cost and environmental aspects of the management of 229,100 tons of post-recovery MSW for the following management alternatives: 1) In-County landfill disposal, 2) In-County WTE with disposal of ash in a local landfill, and 3) Out-of-State landfill disposal. The analysis was conducted using RTI's Municipal Solid Waste Decision Support Tool (MSW-DST). The data and results generated through the study provide a general assessment of the potential tradeoffs in cost, energy, and emissions associated with the management of post-recovery MSW in Frederick County.

Q: Is there an excess operation fee (burning clause) and pass-through costs?

A: The excess operation fee only applies to waste tons delivered by Frederick and Carroll Counties in excess of 547, 500 tons per year. The Counties have no obligation to deliver these waste tons. The pass-through-costs are limited to a few items, such as insurance costs, which cannot be predicted over a long time. All pass-through-costs must be itemized, and there is no vendor mark-up.

Q: Please explain how these costs will not continue to escalate from earlier figures provided?

A: The vendor's not-to-exceed construction cost is linked to a formula that will increase or decrease by a known amount according to a published power plant cost index. [Note: Using this index, the vendor's construction cost has actually decreased by $9,666,180 since November 2008 relative to March 2009].

Q: Is an archeological study (survey) included in the WTE's construction cost?

A: Yes, this cost is included in the vendor's proposal.

Q: Are water use costs included in vendor's proposal?

A: Yes.

Q: Is the cost of the selective catalytic reduction (SCR) rare metal catalyst, which could be as high as $1,000/ounce, included in the vendor's proposal?

A: The vendor's proposal includes the capital and operating cost for a selective **non-catalytic** reduction (SNCR) system, which will meet all current requirements of U.S. and State law. As a precaution, the NEA has included, as a contingency, the capital and operating costs for a SCR system, should the U.S. or State law requirements change. The SCR system uses a catalyst, which is consumed during the process, and is periodically replaced. The catalyst is not "rare", and the cost has been included in the cost estimates presented to the BOCC.

Q: Isn't the cost to long-haul municipal solid waste (MSW or trash) a fraction of what it used to be?

A: The out-of-state trash hauling and disposal cost has increased from $52 to $72, and subsequently retreated to $56/ton. Most economists predict that fuel costs will increase over time—not decrease. The cost comparison information provided to the BOCC was based on the recent $56/ton cost, not the $72/ton cost incurred during the summer of 2008 when diesel fuel prices were at their highest.

Q: How did the cost increase? It will cost $2,380 per man, woman and child in Frederick County.

A: The County compared the disposal cost for the WTE with the alternate cost for loading, transporting and landfilling waste out of State. The WTE alternative, over the project evaluation period, results in a lower cost to the residents. The WTE facility will serve all of the current and future Frederick County residents. The County's share of the regional project's construction cost, including all projected financing and contingencies is $316,311,000, which is 60% of the regional project cost. On a per person served basis this represents a cost of less than $1,375 per person since new (future) residents will also be paying for the project in the form of tipping fees and SBC charges. For comparison, the County's Potomac River Water Supply project which is almost complete, cost $1,124 per person served and the County's Ballenger-McKinney WWTP project, based on current construction cost estimates will result in a cost of $1,933 per person served. This comparison shows the approximate cost per person served for these three essential services. The proposed WTE project is less than the cost to provide wastewater treatment plant capacity only slightly more than providing water supply system capacity.

Q: Will "Peak Oil" affect the facility?

A: The peak oil theory says that oil costs will go up as the oil supply declines. Therefore increases in waste transportation costs will increase resulting in higher costs to transfer waste to out of County landfills. Increases in oil cost may also result in greater electrical demand (e.g., new all-electric cars) resulting in increases prices for electricity, which will only increase the electric sales revenues of the WTE facility that decreases the overall cost for solid waste disposal.

Q: Is the construction a Cost-Plus contract?

A: The draft Construction Agreement or "Service Agreement" is **not** a cost plus contract; it is a fixed price contract. See the Final Draft Service Agreement (page 229 of 526).

Q: Should the County be making such a large investment given the current economic conditions?

A: Building any infrastructure project, such as the WTE facility, at this time actually has several financial advantages. For example, construction costs are decreasing due to the recession, and financing costs should be lower because of lower interest rates on the bonds issued to finance the project.

Q: If there are changes of Federal regulations, would that not cause a very expensive upgrade of emissions removal system of the proposed WTE?

A: The WTE will include the most current emission controls. If regulations require additional controls they will be added to ensure permit compliance. WTE facilities, which are similar to water treatment plants and wastewater treatment facilities, are periodically upgraded as new regulations are enacted These upgrades can be expensive; however, the proposed WTE plant design is already based on meeting anticipated *future* emission limits, reducing the likelihood that an expensive upgrade will be necessary. It is important to note that according to the EPA, WTEs provides "one of the cleanest sources of electricity."

Q: If the Guaranteed Fixed Construction Price of the WTE is expected to cost $332 million, why isn't a new landfill a consideration, since it would cost less?

A: The per ton costs of waste disposal over the project planning period has been the basis for comparison. Acquiring the necessary land and constructing a landfill that would serve the County's waste disposal needs for an equivalent planning period may actually be more costly since landfill costs must include closure and long term post closure maintenance. Furthermore the EPA waste hierarchy recognizes WTE over landfilling for waste disposal and the February 10, 2009 manuscript, "Is It Better To Burn or Bury Waste for Clean Electricity Generation?" describes the benefit of the electrical generation aspect of both.

Traffic Related FAQs

Q: If the McKinney site is considered, has anyone considered what the railroad crossing would do to the traffic (e.g., trains blocking English Muffin Way for up to 15 minutes with the back up of traffic onto MD 85)?

A: The same railroad crosses MD 85, just south of the intersection of English Muffin Way and MD 85. All traffic backs up in this location. If during a peak hour that coincides with the receipt of trucks hauling MSW, this would equate to approximately four (4) trucks during a hypothetical 15 minute period (four on either side of the railroad track). See the related FAQ.

Q: What roads will the trucks be using traveling to and from the WTE facility?

A: Certain municipal solid waste (trash) collection will follow existing routes to the Reich's Ford Road Landfill, which will likely be closest geographically and most cost effective for the private trash haulers. Routes for transfer of waste from the landfill to the WTE facility have not yet been determined. It is anticipated that transfer trucks will follow Reich's Ford Road to I-70 west and US

15/I270 south to MD 85 and south to the McKinney. Back haul of residual ash would likely follow the same route. Recyclables would follow current routes to the Landfill, where the recyclables would be transferred and hauled to the Elkridge, MD materials recovery facility (MRF). See the FAQ pertaining to the preliminary traffic study.

Q: What will the WTE generated traffic do to the area?

A: The present road can accommodate the increased traffic. There are many heavy duty trucks currently on Rte. 85, such as tractor trailers, which service TAMKO, Toys "R" Us and Blue Linx, all of which are in the vicinity of the McKinney Industrial park. Traffic related to the WTE will represent only a small portion of the overall traffic on MD RT 85. Furthermore overall the number of trucks moving waste in Frederick County (including incoming Carroll County waste) may actually decrease with the WTE disposal option, since more trucks will be removed from the County's roads by eliminating the current (Frederick County) waste transfer operation than are added by Carroll County's waste deliveries to a regional WTE. (Note the number of trucks shown in the aerial orthophoto in the vicinity in an earlier FAQ.)

Q: How will the WTE-generated traffic affect my drive to and from work?

A: There should be no difference.

Local Economy Related FAQs

Q: Will the WTE affect tourism?

A: This is a highly subjective question. A tourist is not necessarily a resident and chooses to visit a locale for personal reasons. Tourists visit a variety of locations from highly commercial, industrial, business centers like New York City, where historical, cultural and entertainment destinations do not match that of a Yellowstone Park, or Frederick County for that matter and cannot be effectively quantified. Additionally, tourist attractions change as the community changes and what one considers a tourist attraction (i.e., shopping), another considers it to be detraction. Another specific example is that the current visitors see the existing stack at the cement kiln, I-270 and the Toys "R" Us warehouse from the Monocacy Battlefield. It can be reasoned that these have not had an adverse affect on tourism. Other communities that have WTE facilities near their predominate tourist attractions and have not experienced any change in the number of visitors. For example Ravens Stadium is about a half a mile away from the WTE in Baltimore.

Recycling Related FAQs

Q: Will recyclables be sent to the WTE?

A: The WTE facility will only accept MSW (trash) that remains **after** recycling.

Health Related FAQs

Q: What case studies on a facility of this size have been done and address health concerns including cancer risk studies?

A: A study of cancer rates in the City of Claremont, New Hampshire, where a WTE facility has operated for 20 years, was conducted by the New Hampshire Departments of Environmental Services and Health and Human Services in 2006. The study found that the rates of 24 major cancer types in the community were at or below the statewide average. Additionally, the Cumulative Health Risk Study for the Dickerson Area Facilities stated, "…[T]hat the relative risk of harm to human health presented by cumulative exposure to study area or Dickerson area emissions is low, and that no adverse noncarcinogenic health effects are expected as a result of exposure to cumulative facility emissions." Additional information can be found in the article "Multiple Pathway Health Risk Assessment of a Resource Recovery Facility in Maryland."

Q: Will the resulting ash from a WTE contaminate the groundwater?

A: There are no known instances of groundwater contamination from WTE ash that has been placed in a modern lined landfill such as we have in Frederick County. The Roffman Associates, April 2002 multi-year study of ash monofills found no contamination, either from ash blowing off the landfill, or leachate. (See an answer to an earlier FAQ.)

Q: What are the health impacts of a WTE versus landfill?

A: Additional information in a June 2005 study, "A Health Risk Comparison of Landfill Disposal and Waste-To-Energy (WTE) Treatment of Municipal Solid Wastes In New York City (NYC)," provides a rough estimation and comparison of the health impacts from landfill disposal and WTE treatment.

Q: During the public hearing, someone suggested that the Dickerson coal-fired facility emits 2 million pounds of particulates per year. Is that true?

A: There is a 930 MW coal-fired power plant in Dickerson, in addition to a 68 MW WTE facility. The WTE facility removes over 99% of particulates. The most recent EPA data (2002) shows that Dickerson emitted 3,040 tons per year for particulates less than 10 microns (or approximately 6,080,000 pounds), whereas the Montgomery RRF (WTE) emitted 13 tons per year (or approximately 26,000 pounds).

Q: There is a cancer study in Poolesville. Are there any concerns that the two smoke stacks; one from coal and the other from the WTE is attributable to the WTE?

A: A website contains the most recent information on the Poolesville Cancer Study. An excerpt from the website is reprinted below:

"*Q4. What is the exposure of Poolesville residents to the incinerator by products?*

A4. In 1989, as part of the application for air quality construction permits for the resource recovery facility (RRF), Montgomery County submitted a Health Risk Study that was prepared by Weston. The assessment considered multiple exposure pathways, including inhalation of particulate and gaseous pollutants in the air, incidental ingestion of contaminated soils, and consumption of locally grown foods such as beef and fish. The conclusion drawn from the multi-source, multi-pollutant, multi-pathway modeling study was that residents surrounding the industrial site were not exposed to any significant increase in health risks.

In 2003, Montgomery County submitted an Update of Health Risk Study for the RRF. The updated assessment was based on six years of operating data, including actual stack test emissions from the RRF. In general, the actual emissions used in the updated risk assessment were approximately 10 times lower than the worst case emission estimates used in the Weston assessment. As a consequence, the actual health risk associated with the RRF is significantly lower than the predicted risk established in the original health study. The Maryland Department of Natural Resources, Power Plant Research Program, has reviewed the updated health risk study and endorsed its findings."

Various risk assessment studies are available at the Montgomery County Government website, including the Update of Health Risk Study.

Q: While particles are the easiest things to remove using primarily electrostatic precipitators, what about the removal of sulfur dioxide?

A: Acid gases such as sulfur dioxide are removed when a neutralizing agent (lime) is sprayed into the flue gases. The acid gas emissions are monitored every six minutes by a computerized monitoring system for compliance with permit limits. Particulate removal will be done with bag-houses, essentially large vacuum bags, which capture the particulates before leaving the stack. The addition of carbon to the combustion system binds heavy metals, such as mercury, to the ash, so that it does not leave the WTE as a gas. Once bound to the ash, the lime used for acid gas scrubbing, further solidifies the ash.

Q: What goes up the stack?

A: The primary substances emitted are water and carbon dioxide. Other trace emissions will be well below federal and state environmental protection limits and are identified on Page 4 of the PowerPoint presentation.

Q: Even though there is no WTE in Frederick County, there are particulates that cover my automobiles, patio furniture, swing sets, etc., and there is concern about allowing children to play in their yards. Please explain.

A: Advanced particulate control means 99.9% of particulates are captured in a WTE facility. As a matter of information, there are substantial amounts of particulates emitted from diesel engines from trucks and school buses.

Q: Does the proposed WTE plant include the cost of selective catalytic reduction (SCR) for NO_x control, if required?

A: Yes, it is included in the cost projections presented on February 3, 2009.

Q: What about the increased resultant emissions from the trucks (diesel) going to and from the proposed WTE?

A: Currently, trucks are carrying Frederick County's waste to landfills in Virginia and Pennsylvania. The WTE facility would create less truck traffic through and beyond Frederick County. (Also, see the FAQs pertaining to traffic.)

Additional information in a study "Cars and Cancer: Toxic Pollution from Cars and Trucks in Maryland", prepared by the Environment Maryland Research & Policy Center, December 2006 provides additional perspective on the questions and concerns.

See the EPA's information on Emissions by Category Chart - Criteria Air Pollutants for:

Pollutant: Particulate (size < 10 micrometers) in Frederick, County Maryland.
Pollutant: Particulate (size < 2.5 micrometers) in Frederick, County Maryland.
Pollutant: Particulate (size < 2.5 micrometers) in Frederick, County Maryland
Pollutant: Carbon Monoxide, Ammonia, Nitrogen Oxides, Particles < 10 micrometers diameter, Particles < 2.5 micrometers diameter, Sulfur Dioxide, Volatile Organic Compounds, in Frederick, County Maryland.

Q Please explain what the increased dioxin emissions will be from the WTE and are there other sources of dioxins that we should be concerned about?

A: There are numerous sources of dioxins, each of which are dispersed in wide arrays of mode and concentrations that vary greatly by relative and individual tolerable and intolerable perceptions. Specifically, the amount of dioxins emitted and measured by the WTE facility will be extremely low. The U.S. EPA in 2002 stated that all of the existing WTE facilities in the U.S. emit a total of 12 grams of dioxin per year. By comparison, the EPA has estimated that forest and brush fires emit over 1,000 grams of dioxin per year nationwide, and that backyard burning of trash emits about 500 grams of dioxin per year across the country. For additional information, see "Dioxin Inventory of Sources (Optimized report)".

According to the American Chemistry Council, "To illustrate how polluting backyard trash burning is, the dioxin released by the backyard burning of 20 families' trash for a year is equivalent to that released by a state-of-the-art combustor serving 150,000 families.[4] According to US EPA data, the average dioxin emission from large US municipal waste combustors in the year 2000 was 0.072 grams-TEQ.[5] This amount is approximately the same as the weight of a 1-inch long straight pin (0.094 grams)."

Other sources include, but are not limited to:

It has also been reported that the concentration of dioxins in cigarette smoke (around 1.81 ng I-TEQ/m^3, which is 18 times higher than the emission standard of 0.1 ng I-TEQ/m^3 for modern

incinerators) would have more significant impact on human health because cigarette smoke is inhaled directly into the lungs without diffusion and/or dilution.

The European Union (EU) has not set a standard for ambient air since the EU experts consider that inhalation is a very insignificant route of exposure to dioxins.

In a University of Michigan Study (October 2007), firing clay in unvented kilns could be a significant source of dioxins in people exposed regularly and over long periods.[1] Excerpts from the study:

> *Ceramics clay, sometimes referred to as ball clay, is known to be contaminated with dioxins, and Franzblau said the woman's clay displayed the same pattern of contamination shown previously to exist in ball clay tested in America and Europe. However, there are no previous reports suggesting that dioxins in clay can be a direct source of contamination for humans.*
>
> *"We think they breathed it in from the volatilization when they fired the kiln," Franzblau said. The woman with the highest levels had three unvented kilns in her basement, so the fumes were released directly inside her home. Two other women who were ceramics enthusiasts also had elevated dioxin levels, though not nearly as high as the first woman. The two other women had kilns in their garages (not inside their homes), and did not use them as often.*

[1] University of Michigan (2007, October 25). "Firing Clay In Unvented Kilns May Be A Source Of Exposure To Dioxins". *ScienceDaily*. Retrieved April 13, 2009, from http://www.sciencedaily.com/releases/2007/10/071023163844.htm